

National Weather Service
Lincoln, Illinois

Central Illinois Lincoln Logs



Volume 14, Issue 2

Summer 2011

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New Climatological Normals Effective July 1

By: Chris Geelhart, Meteorologist

The National Climatic Data Center (NCDC) released new climatological normals for the nation on July 1. The normals are based on a 30 year period (now 1981-2010) due to requirements by the World Meteorological Organization.

In the strictest sense, a "normal" of a particular variable (e.g., temperature) is defined as the 30-year average. For example, the minimum temperature normal in January for a station would be computed by taking the average of the 30 January values of monthly-averaged minimum temperatures from 1981 to 2010. Each of the 30 monthly values was in turn derived from averaging the daily observations of minimum temperature for the station. In practice, however, much more goes into NCDC's Normals product than simple 30-year averages. Procedures are put in place to deal with missing and suspect data values. In addition, Normals include quantities other than averages such as degree days, probabilities, standard deviations, etc. Normals are a large suite of data products that provide users with many tools to understand typical climate conditions for thousands of locations across the United States. In the latest release, temperature normals were calculated for 7,500 stations across the country, and precipitation normals were calculated for 8,700 stations.

Normals are used by meteorologists and climatologists for placing recent climate conditions into historical context. They are used by many applications across various sectors. They include media broadcasts, regulation of power companies, energy load forecasting, crop selection and planting times, construction planning, building design, and more.

Climatological summaries from the Lincoln NWS began using the new normals on August 2, after a software upgrade. Previously, normals were only available for the Springfield, Peoria, and Lincoln climate summaries. Normals are now available for Willard Airport near Champaign, Decatur Airport, Coles County Airport near Mattoon, and Lawrenceville-Vincennes Airport, and these have been added to the climate summaries issued for these locations.

The new normals are also available on our web site. Visit the following links for specific data:

- [Springfield](#)
- [Peoria](#)
- [Lincoln](#)
- [Other locations in central and southeast Illinois](#)

NWS Facebook Page Goes “Live”

By: Darrin Hansing, Service Hydrologist

National Weather Service Offices from around the United States have jumped into the Facebook era... including our office in Lincoln, Illinois. Our Facebook page went live on June 1st and has quickly amassed over 1500 “likes”. Through this social media outlet we are experimentally disseminating environmental information and promoting weather awareness activities across central and southeast Illinois.

On our Facebook page our Weather Story Graphic and associated narrative will be posted daily to give our users an overall weather picture for the next day or two. Here you may also see links to severe weather threat information, “Top News of the Day” articles, outreach information, spotter talk schedules, climate summaries, weather tidbits, safety information, and more! It is important to note that our Facebook posts do not always reflect the most current information. Also fans of our page should not rely on this service as a primary

means of receiving alerts/warnings of hazardous weather. NWS alerts/warnings are available on NOAA Weather Radio and our official website: <http://www.weather.gov/ilx>. As a supplemental service, the amount and content of information provided on Facebook may change and the frequency of updates posted to the page may vary.

With that said, our Facebook page is not just an outlet to disseminate and promote NWS products and services. It is also a means by which you can share your feedback, questions, and weather observations with us.

Share your comments and feedback. Your feedback helps in making sure that we are providing the best services possible...especially in fulfilling our primary mission of protecting lives and property. It also helps us to identify areas where we can improve to better serve the public.

If you have an important question for us then post it on Facebook. Although we are not able to respond to all posts, we will do our best to try and answer any reasonable weather-related question you may have.

Have hazardous weather information to share? If you are experiencing hazardous weather in your area then you are encouraged to post comments and pictures on our Facebook page. We rely significantly on ground truth information and this can be an excellent way to share it with us. Keep in mind though that during hazardous weather events we will likely not be able to actively respond to your posts, but we are monitoring our page for these important storm reports.

Take a look and let us know what you think!



“Facebook is a means by which you can share your feedback, questions, and weather observations with us.”

Lincoln NWS Facebook Address:

<http://www.facebook.com/US.NationalWeatherService.Centrallllinois.gov>

*Case Review:***The July 2011 Heat Wave**

By: Chris Geelhart, Meteorologist

July went down as a hot and humid month over a large part of the nation.

Upper level high pressure was very persistent over the central portion of the United States (figure 1) throughout the month. This high started to push eastward the week of the 18th, spreading the brutal heat and humidity toward the mid-Atlantic coast and New England. Preliminary analysis indicated that only the areas west of the Rocky Mountains averaged temperatures below normal for July. The worst of the heat extended from Texas northeast into the Midwest, where temperatures averaged 6 to 10 degrees above normal.

During the month, much of central and southeast Illinois saw between 17 and 25 days of highs at least 90 degrees or higher. Consequently, average high temperatures were above 90 degrees in areas south of I-72, and just below 90 further north.

The most brutal stretch of heat was the week of the 17th. High temperatures of 95 to 100 degrees were common, with dewpoints frequently in the upper 70s or even in the 80s. This pushed heat index values well over 105 degrees, and occasionally as high as 115 to 120 degrees! Excessive Heat Watches for this area were issued as early as Thursday, July 14th, not going into effect until the 17th. This watch was upgraded to an Excessive Heat Warning on Friday the 15th, again effective until the 17th. This warning was ultimately in effect until Sunday, July 24th. Having watches and warnings out that far in advance, and for such a long duration, was very unusual. However, this gave local officials plenty of time to set up cooling shelters and take other preparations to make sure local areas were prepared for the heat.

During the heat wave, Urbana reached 100 degrees on 3 different days (19th, 21st, and 22nd). In contrast, the last time Urbana reached 100 degrees was in July 1995. Further west, Springfield observed 14 straight days of highs 90 or above, from the 16th through the 29th, its longest such stretch of hot weather since 1955.

Some national highlights of the July heat:

- Oklahoma City (average temperature 89.2 degrees) and Washington DC (84.5 degrees) observed their hottest month on record.
- Dallas had highs above 100 degrees every day except the 1st (when the high was “only” 98).
- All-time record highs were set at Newark, NJ (108 degrees) and Bridgeport, CT (103) on the 22nd.

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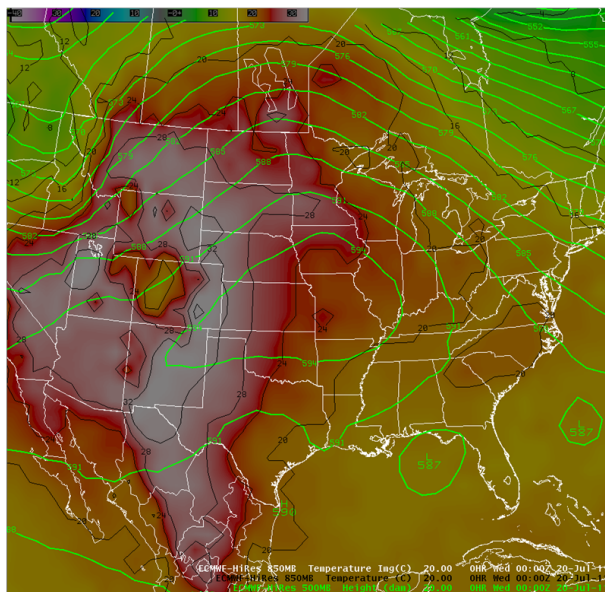
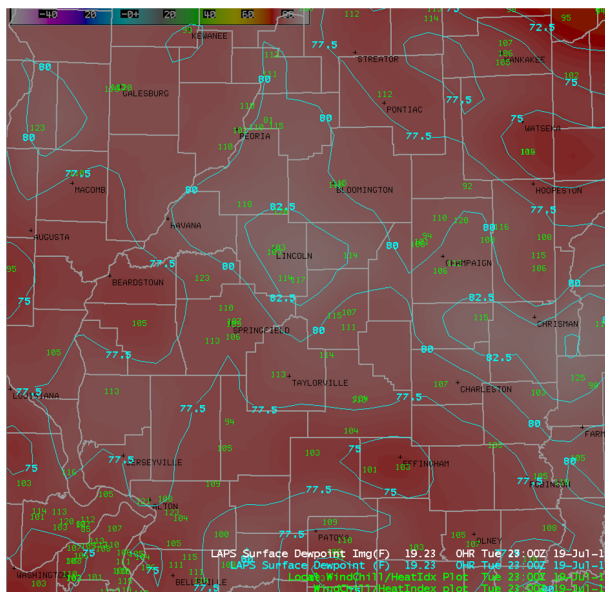


Figure 1 (above): Upper air analysis at 7 pm Tuesday, July 19. The green lines show a large area of high pressure aloft (at 500 mb) over the Plains, extending north into Canada. The shaded image shows temperatures at 850 mb; red shades start at approximately 25 °C and the white shades around 28 °C.

Figure 2 (below): Dewpoint temperatures over central Illinois at 6 pm Tuesday, July 19. Many areas saw dewpoints in excess of 80 degrees (blue contours). As a result, heat index values (green numbers) ranged from 105 to 120 degrees.



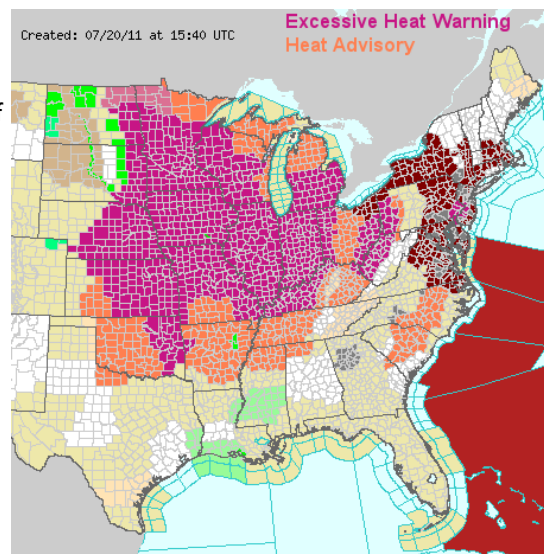
July 2011 Heat Wave (continued)

- Moorhead, MN (across the border from Fargo, ND) set a state record on the 19th with a dewpoint of 88 degrees.
- Minneapolis reported 98 consecutive hours with a dewpoint of at least 75 degrees.
- Approximately 20 people in Illinois died due to the heat (15 in the Chicago area).
- Approximately 4,000 head of cattle reportedly died in Iowa due to the heat, the week of the 17th.

Because the upper high pressure was in place for so long, storm tracks were generally steered further to the north. As a result, rainfall over most of central Illinois was only a quarter to half of what should have occurred during July. The dry spell and the persistent heat took its toll across the Midwest, drying out the soil from earlier excesses and beginning to stress area crops. Further south, existing drought conditions were further exacerbated due to the heat.

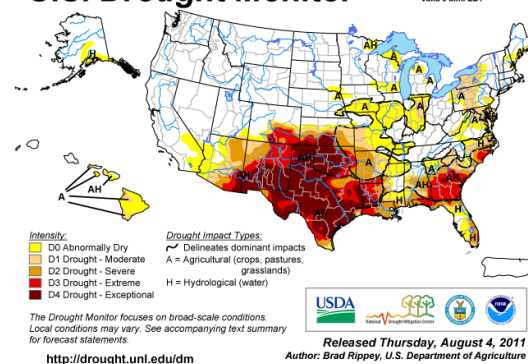
Figure 3 (top): National map of watches, warnings and advisories the morning of July 20. Excessive Heat Warnings (in purple) affect portions of 19 states.

Figure 4 (bottom): U.S. Drought Monitor on Thursday, August 2. Much of central Illinois was classified as "abnormally dry" (yellow shading). "Exceptional" drought is shown in brown, affecting much of the southern Plains into the southern Rockies.



U.S. Drought Monitor

August 2, 2011
Valid 8 a.m. EDT



Spring Climate Statistics:

Peoria:

- Average temperature: 51.9° F (0.9° F above normal)
- Total precipitation: 14.60" (4.04" above normal)
- Total snowfall: Trace (4.2" below normal)

Springfield:

- Average temperature: 54.6° F (1.9° F above normal)
- Total precipitation: 10.41" (0.16" below normal)
- Total snowfall: Trace (4.1" below normal)

Lincoln:

- Average temperature: 52.3° F (1.5° F above normal)
- Total precipitation: 10.60" (0.56" below normal)
- Total snowfall: Trace (2.7" below normal)

Normals based on the 1971-2000 period

Frequently Asked Questions: Lightning

By: Chris Miller, Warning Coordination Meteorologist

Throughout the year, and across central and southeast Illinois, our office does a lot of outreach. This can range from spotter training classes, to talks at schools, utilities, local businesses, civic and church groups or tours of our facility in Lincoln. During these outreach visits, we are asked many questions about the workings of our atmosphere. In this newsletter article, and in future installments, I want to share with you some of the most frequently asked questions. After all, if people at the talks we do are asking these questions, most likely many of you are wondering also! This time I will be addressing questions about lightning.

• **Question: What is heat lightning?**

Answer: Heat lightning is a term that has been around for many years. Prior to the use of weather radar or reports from storm spotter groups, people often did not know that a thunderstorm was occurring several miles away. They saw lightning flashing (mainly at night), but could not hear the thunder. The thought was that if you could not hear the thunder, then the lightning was caused by the atmosphere discharging electricity that built up after a warm day. Thus, the term heat lightning was born.

We now know that this does not happen. Lightning is caused by a thunderstorm. If you don't hear the thunderstorm but see lightning, then it is too far away for the sound waves of the thunder to reach you. Depending on atmospheric conditions, the bending of sound waves, the curvature of the earth, and the amount of clouds in the sky, flashes of lightning from a distant thunderstorm can be seen, but not heard as close as 10 miles, and as far away as 100 miles. However, heat lightning can sometimes be an indication that thunderstorms are approaching your area.

• **Question: Is there a way to figure out how far a lightning strike is from you by counting?**

Answer: Yes – there is a very simple way. When you see a flash of lightning, start counting. When you hear the thunder – stop counting, and then divide by 5. This will tell you how many miles away the lightning bolt was. So, if you count for 15 seconds, the lightning was 3 miles away. If you can only count a couple of seconds – or the flash and bang occur together – then the lightning was REALLY close to you (and you better be indoors or in an enclosed hard topped vehicle with the windows shut)!

This works because the speed of light – the flash of lightning – is extremely fast (more than 670 million MPH!), so you see it immediately. However, the speed of sound – the thunder – travels slower (around 760 MPH). This means it takes the sound of the thunder about 5 seconds to travel one mile.

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Lightning strikes a tree. Photo courtesy of NOAA.

The sound of thunder takes about 5 seconds to travel one mile. To tell how far away lightning is, count the seconds between lightning and thunder, and divide by 5.



Lightning near Arthur on July 2. Photo courtesy Paul Hadfield.

Frequently Asked Questions (cont.)

- **Question: Does a lightning bolt come down from the cloud or up from the ground?**

Answer: Actually, a complete lightning bolt comes from both directions. We can break this up into five steps:

- Step 1: There are positive and negatively charged particles in a thunderstorm. The negative particles are brought down to the lowest part of the cloud – mainly by ice particles in the thunderstorm.
- Step 2: Positive charges collect below the thunderstorm at the ground and travel with it. Air is an insulator, so a HUGE electric potential builds up between the ground and the storm (as much as 100 million volts!)
- Step 3: The positive charges at the ground tend to rise up tall objects (trees, power poles, buildings, etc...) due to the huge electric potential. A channel of negative charges, invisible to the naked eye, descends from the cloud – this is called the “stepped leader”.
- Step 4: The positive charges climbing up ground based objects, reach upward into the air with a channel called the “streamer”. The connection between the “stepped leader” and “streamer” is the lightning we see.
- Step 5: If enough electrical charge is in the cloud, another channel will move down toward the ground – called the “dart leader”. This is what gives lightning its “flicker” of light.

All five steps typically occur in only 1/20th of a second (0.05 seconds) with a peak charge of more than 30,000 amps!

If you have a weather question you would like us to answer in a future newsletter, send an E-mail to chris.geelhart@noaa.gov.

“A complete lightning bolt comes from both the cloud downward, and the ground upward.”

Cooperative Length of Service Awards

Several cooperative weather observers are scheduled to receive Length of Service Awards this year.

Audrey Mushrush of Hoopeston highlights this list. She is due to receive the Helmut E. Landsberg Award, given to COOP observers who have completed 60 years of service. The observations were begun by her late husband John in May 1951, and she took them over when he passed away several years ago.

Clarence Unkraut of Effingham completed 15 years of service on June 1.

Phillip Frank of Athens will mark 15 years of service on September 9th.

Larry Woller of Ogden will observe 10 years of service on August 21.

We thank our observers for their years of dedicated service to their country!

“The 60 Year Length of Service Award is named after Helmut E. Landsberg, who was largely responsible for establishing the nationwide climatological network as we know it today.”

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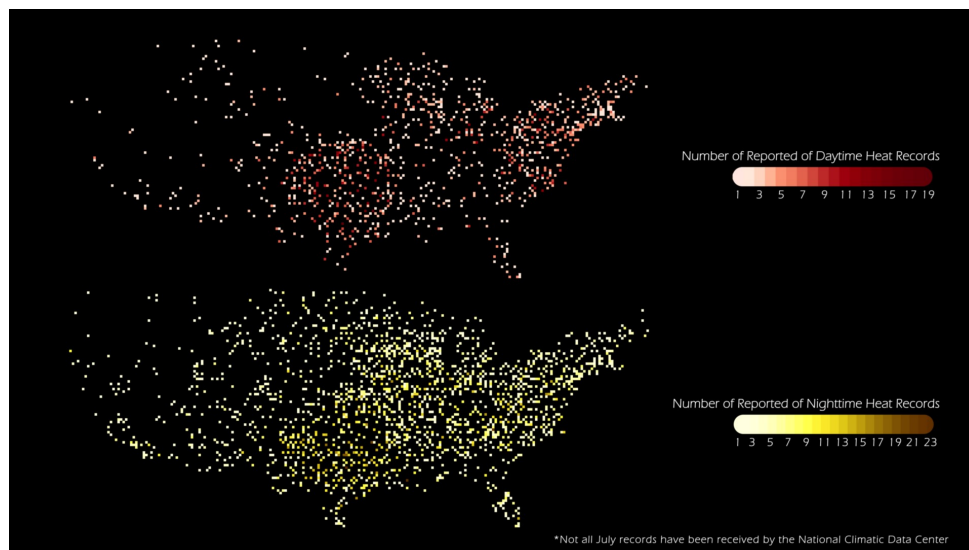
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The *Central Illinois Lincoln Logs* is a quarterly publication of the National Weather Service office in Lincoln, Illinois. It is available on our Internet page at

www.weather.gov/lincoln

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Heat Defines the Country in July



How hot was the month of July? So hot that just by plotting the location of each daily heat record that was broken, a nearly complete image of the contiguous United States is visible. Almost 9,000 daily records were broken or tied last month, including 2,755 highest maximum temperatures (top part of image) and 6,171 highest minimum temperatures (i.e., nighttime records, lower part of image). It should be noted that the tally of records collected so far is not complete – more are expected to come in as station data from across the U.S. is mailed to the National Climatic Data Center. The statistics reported here only include weather stations with real-time electronic reporting, which accounts for about two-thirds of the locations. Final numbers should be available later in August.

This image plots how many times a heat record was broken or tied in a given location. Some cities reached daily high temperatures 19 out of the 31 days in the month. The largest concentration of these records occur in the southern Plains, Midwest, and Northeast U.S., which were gripped by a series of heat waves pushing heat indices well into the 100's for many days at a time.

Temperature records are based on historical data from NCDC's Cooperative Summary of the Day data set and the preliminary reports from the Cooperative Observers and National Weather Service stations around the country. All stations have at least 30 years of data upon which these records are based.

(Information courtesy of the NOAA Environmental Visualization Laboratory)